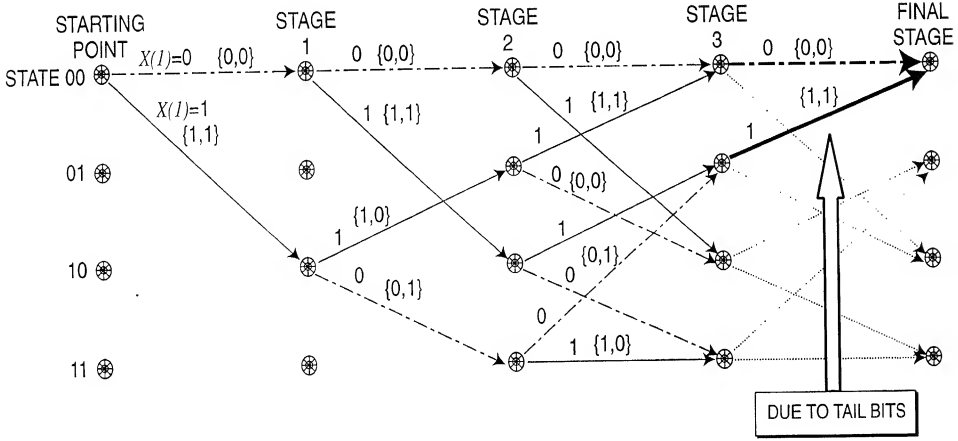


FIG. 1
PRIOR ART

20020-0455007

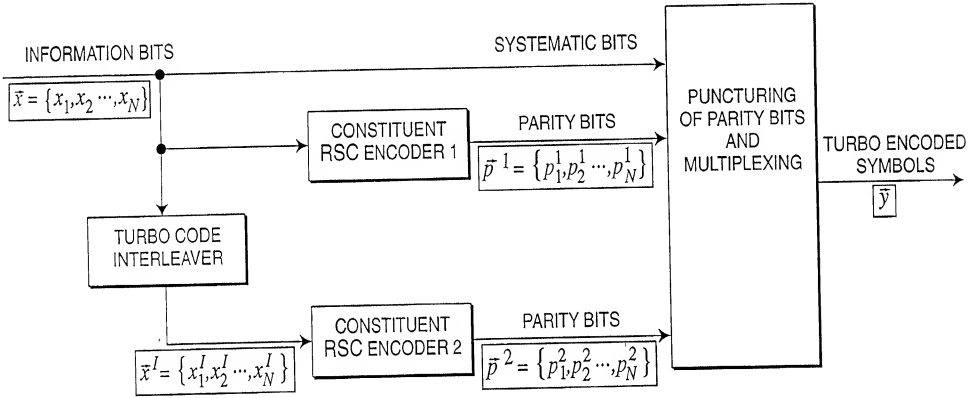


FIG. 2
PRIOR ART

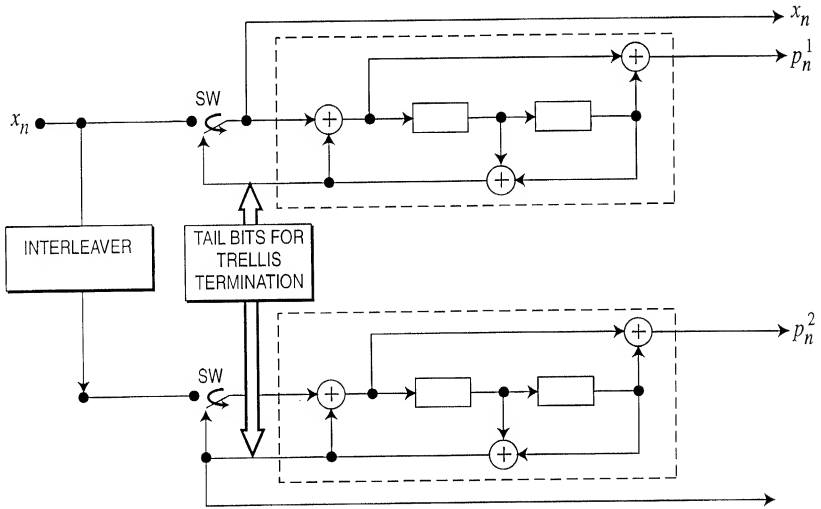
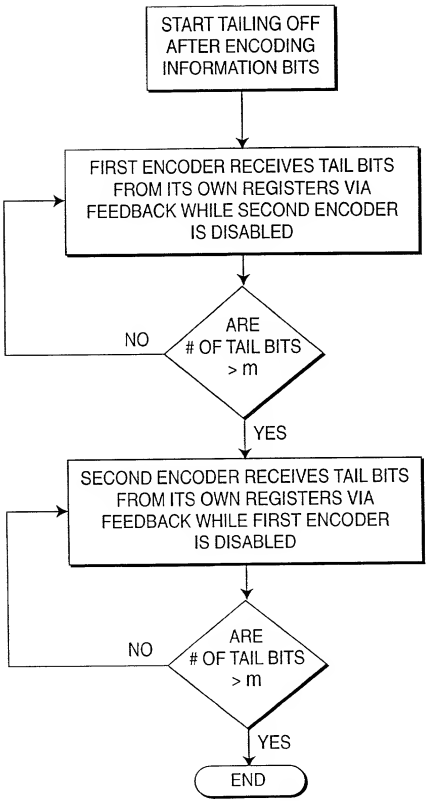


FIG. 3
PRIOR ART



TOTAL # OF TAIL BITS = 2 m

TOTAL # OF TAIL CODED SYMBOLS = (2)(2 m)

FIG. 4
PRIOR ART

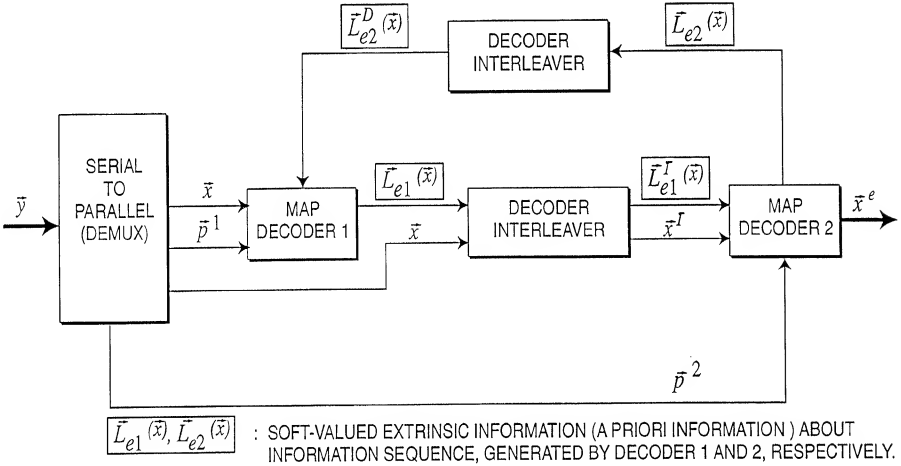


FIG. 5
PRIOR ART

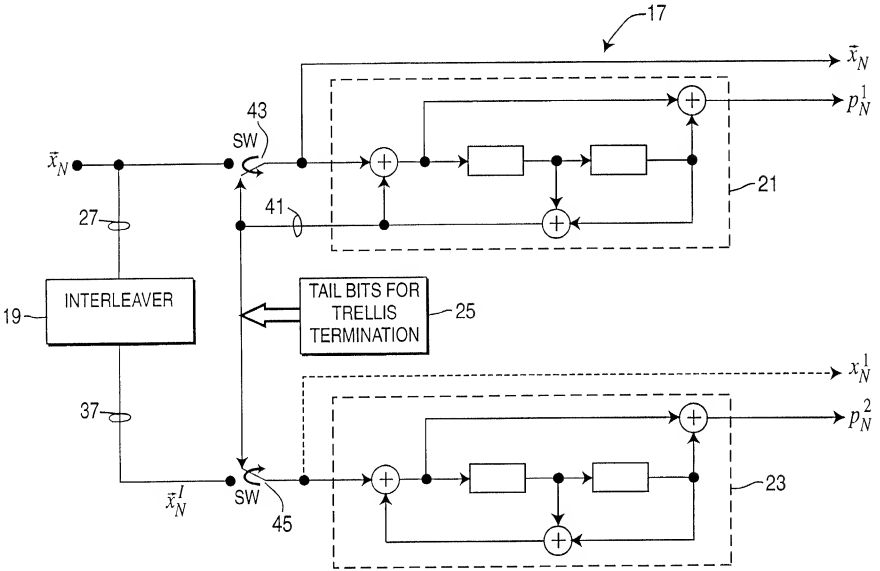

17
$\tilde{x}_N$
p_N^1
43
SW
$\tilde{x}_N$
21
27
41
INTERLEAVER
19
TAIL BITS FOR TRELLIS TERMINATION
25
x_N^1
p_N^2
37
$\tilde{x}_N^I$
SW
45
23

FIG. 6

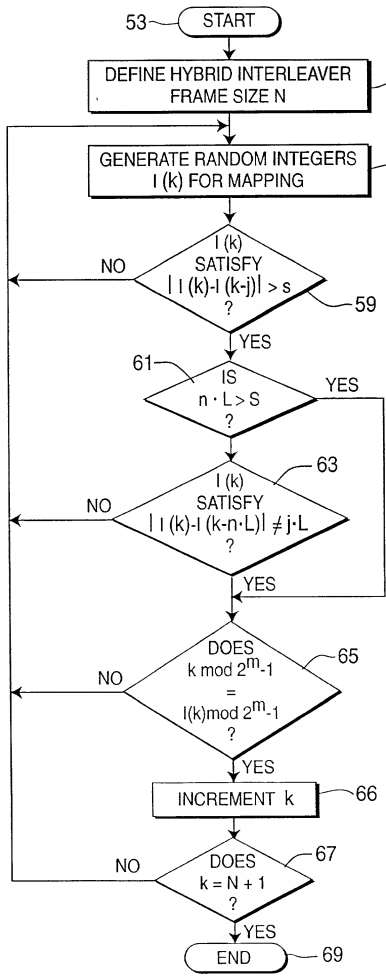

START
53
51
DEFINE HYBRID INTERLEAVER FRAME SIZE N
55
GENERATE RANDOM INTEGERS I (k) FOR MAPPING
57
I (k) SATISFY | I (k)-I (k-j)| > s ?
59
NO
YES
61
IS n · L > S ?
YES
I (k) SATISFY | I (k)-I (k-n·L)| ≠ j·L ?
63
NO
YES
DOES k mod 2^m-1 = I(k)mod 2^m-1 ?
65
NO
YES
INCREMENT k
66
DOES k = N + 1 ?
67
NO
YES
END
69

FIG. 7

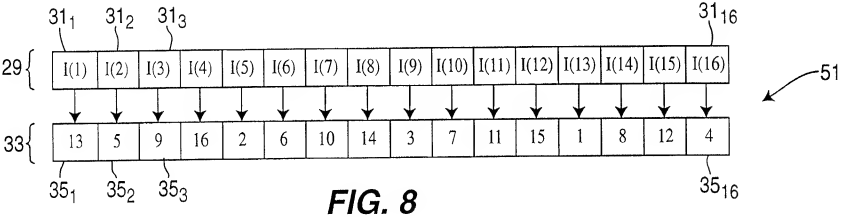

31 1
31 2
31 3
31 16
29
I(1) I(2) I(3) I(4) I(5) I(6) I(7) I(8) I(9) I(10) I(11) I(12) I(13) I(14) I(15) I(16)
51
33
13 5 9 16 2 6 10 14 3 7 11 15 1 8 12 4
35 1
35 2
35 3
35 16

FIG. 8

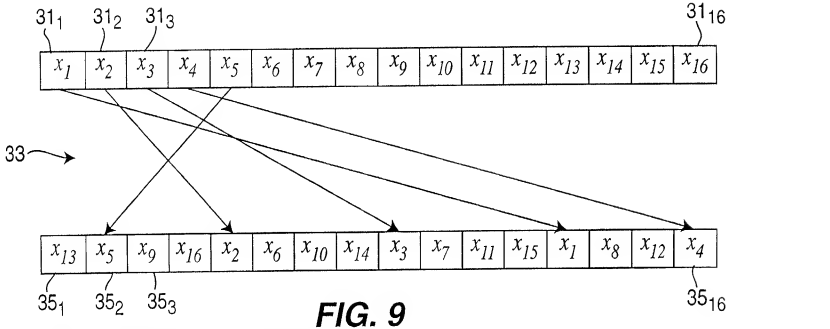

31 1
31 2
31 3
31 16
x1 x2 x3 x4 x5 x6 x7 x8 x9 x10 x11 x12 x13 x14 x15 x16
33
x13 x5 x9 x16 x2 x6 x10 x14 x3 x7 x11 x15 x1 x8 x12 x4
35 1
35 2
35 3
35 16

FIG. 9

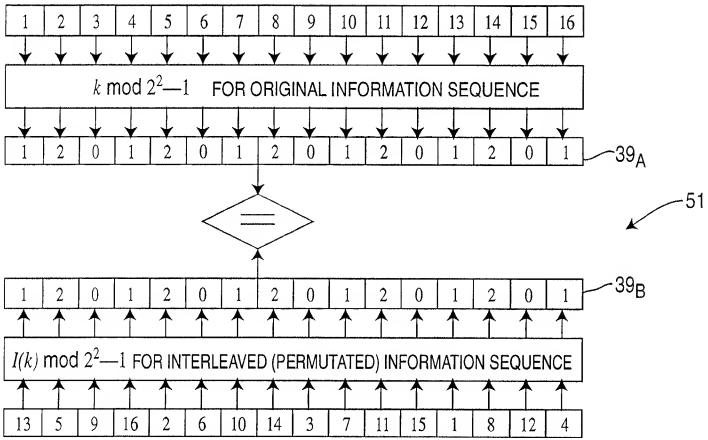

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
k mod 2²—1 FOR ORIGINAL INFORMATION SEQUENCE
1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1
39A
51
1 2 0 1 2 0 1 2 0 1 2 0 1 2 0 1
39B
I(k) mod 2²—1 FOR INTERLEAVED (PERMUTATED) INFORMATION SEQUENCE
13 5 9 16 2 6 10 14 3 7 11 15 1 8 12 4

FIG. 10

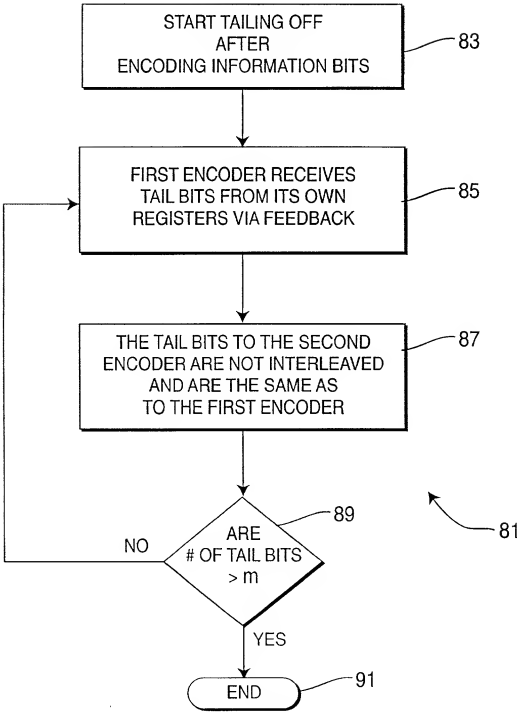

START TAILING OFF AFTER ENCODING INFORMATION BITS
83
FIRST ENCODER RECEIVES TAIL BITS FROM ITS OWN REGISTERS VIA FEEDBACK
85
THE TAIL BITS TO THE SECOND ENCODER ARE NOT INTERLEAVED AND ARE THE SAME AS TO THE FIRST ENCODER
87
ARE # OF TAIL BITS > m
89
81
NO
YES
END
91
TOTAL # OF TAIL BITS = m
TOTAL # OF TAIL CODED SYMBOLS = 2 m

FIG. 11

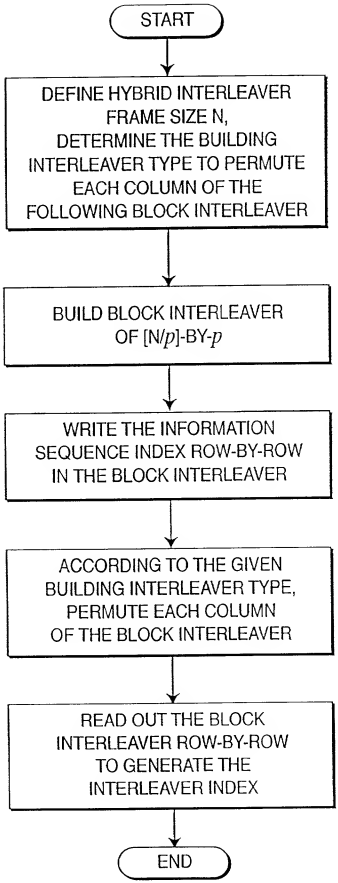

START
DEFINE HYBRID INTERLEAVER FRAME SIZE N, DETERMINE THE BUILDING INTERLEAVER TYPE TO PERMUTE EACH COLUMN OF THE FOLLOWING BLOCK INTERLEAVER
NOTE THAT IN PRINCIPLE THE BUILDING INTERLEAVER CAN BE OF ANY EXISTING INTERLEAVER TYPE LIKE (BLOCK INTERLEAVER, MIL, CDI)
BUILD BLOCK INTERLEAVER OF [N/p]-BY-p
WHERE [N/p] DENOTES THE SMALLEST INTEGER VALUE LARGER THAN OR EQUAL TO N/p, WHERE p IS EQUAL TO 3 AND 7 FOR 4-STATE AND 8-STATE TURBO-CODES, RESPECTIVELY
WRITE THE INFORMATION SEQUENCE INDEX ROW-BY-ROW IN THE BLOCK INTERLEAVER
ACCORDING TO THE GIVEN BUILDING INTERLEAVER TYPE, PERMUTE EACH COLUMN OF THE BLOCK INTERLEAVER
NOTE THAT EACH COLUMN. HAS THE DIFFERENT MAPPING PATTERN.
READ OUT THE BLOCK INTERLEAVER ROW-BY-ROW TO GENERATE THE INTERLEAVER INDEX
END

FIG. 12